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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/759,885

01/15/2004

Edward W. Sheridan

EM- 1989

8465

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EXAMINER

SAVAGE, JASON L

ART UNIT

PAPER NUMBER

1775

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/19/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/759,885

Applicant(s)

SHERIDAN ET AL.

Examiner

Jason L. Savage

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2-14-07 has been entered.

***Claim Objections***

Claims 1-8 and 10-17 are objected to because of the following informalities: In claim 1, lines 2-3, the recitation that there is a layer of material containing metals which are substantially not in oxide form, namely (emphasis added)... is objected to since the limitation claim could be interpreted as being a preferred embodiment and not necessarily a required limitation. For the purposes of Examination, the claim has been treated as meaning that the metals not in oxide form is selected from the group consisting of non-adducted metal hydrides and metals with interstitial hydrogen. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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Claims 1-8 and 10-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitation that the layer not in oxide form be selected from "non-adducted metal hydrides" is not described in the specification or claims as originally filed and is considered new matter. The mere absence of a positive recitation is not basis for an exclusion (See *Ex parte Graselli*, 231 USPQ 3693 (Bd. App. 1983), *aff'd mem.*, 738 F.2d 453 (Fed. Cir. 1984).

### ***Double Patenting***

Claims 1-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 14 and 5-8 of copending Application No. 10/923,865 of Sheridan et al. (US 2005/0189050). Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 14 of Sheridan recites an energetic material comprising layers of a first reducing material and an oxide. Claim 5 of Sheridan further claims that the reducing material is a metal. Although Sheridan does not claim the layer thicknesses, it would have been obvious to one of ordinary skill in the art to have provided the layers in any thickness that would make the energetic composition suitable for the use in which it would be intended. Claim 6-8 of Sheridan recites that the metal material may be Al, Ti,

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Li, Mg and may be in hydride form and the oxide material is an oxide of phosphorus.

Regarding the limitation that the metal hydride be non-adducted, it would have been within the purview of one of ordinary skill in the art to have selected any known metal hydride of the claimed metals with a reasonable expectation of success.

Regarding claims 3-6 of the present invention, although Sheridan does not claim there are pluralities of each layer formed, it would have been obvious to one of ordinary skill in the art to have provided multiple layers of each of the material layers such as is depicted in Figure 2 of Sheridan.

Regarding claims 7, 10 and 18-19, claim 6-8 of Sheridan recites that the metal material may be Al, Ti, Li, Mg and may be in hydride form and the oxide material is an oxide of phosphorus.

Regarding claim 8, claim 1 of Sheridan recites the oxide is of phosphorus.

Regarding claims 11 and 20, although Sheridan is silent to the use of interstitial hydrogen, it would have been obvious to one of ordinary skill in the art to have provided the metals in the form of interstitial hydrogen.

Regarding claim 13, although Sheridan does not claim adhering the composition to a substrate or the materials used, it would have been obvious to have formed the composition on a base substrate of any of the materials claimed.

Regarding claims 15-16, Sheridan teaches phosphorus and Mg may be used, as such, it would meet the claim limitations after the material is detonated.

Regarding claim 17, the energetic composition of Sheridan would have been just as useful for use in a tampering device as that claimed by Applicant.

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This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-8 and 10-21 are rejected under 35 U.S.C. 103(a) as obvious over Danen et al. (US 5,266,132).

Danen teaches an energetic material comprising a plurality of layers **A** and a plurality of layers of materials **B** which are reactive with one another wherein the layers have thicknesses from between 1-1000 nm (col. 2, ln. 16-68 and Figure 1). Danen further teaches that the layers may comprise a metal such as aluminum and an oxide such as cupric oxide (col. 3, ln. 15-33).

Regarding the limitation that the layer in non-oxide form be selected from non-adducted metal hydrides and metals with interstitial hydrogen, Danen teaches that the reacting materials may include aluminum, titanium, magnesium, lithium and hydrides thereof (col. 5, ln. 9-44). Although Danen does not exemplify an embodiment wherein the metal hydride materials are non-adducted or contain interstitial hydrogen, it would have been within the purview of one of ordinary skill in the art to have selected any known metal hydride of the claimed metals with a reasonable expectation of success.

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Absent a teaching of the criticality or showing of unexpected results of the metal hydride compounds being non-adducted metal hydrides, it would not provide a patentable distinction over the prior art.

Regarding claim 5, Danen teaches that layers A and B are adjacent to one another (Figure 1). In the alternative, although Danen teaches a buffer layer **b** is formed between them, Danen teaches that the buffer may be a self-buffering which results from an initial reaction between adjacent layers of the layers **A** and **B** (col. 3, ln. 15-33). As such, the composite of Danen would meet the limitation of layers **A** and **B** being adjacent to one another.

Regarding claims 7-8, 10-11 and 18-20, Danen teaches that the reacting materials may include aluminum, titanium, magnesium, lithium and hydrides thereof and that the oxide materials may include Fe (col. 5, ln. 9-44).

Regarding claim 12, the sputtering deposition of Danen (col. 3, ln. 43-62) would result in the same composite as that claimed by Applicant.

Regarding claim 13, Danen teaches composite may be formed on any conventional substrate material including those claimed by Applicant (col. 4, ln. 20-30).

Regarding claim 14, Danen teaches the composite is suitable for use in explosive applications (col. 1, ln. 9-15). As such, it would have been obvious to one of ordinary skill in the art to have employed energetic materials typically employed in explosive applications such as those claimed into the energetic material of Danen with a reasonable expectation of success.

Regarding claim 15, Danen teaches the same energetic material structure as that claimed by Applicant. Furthermore, Danen teaches the composite is suitable for use in explosive applications (col. 1, ln. 9-15). As such, one would expect that energetic fragments would form upon detonation just as that claimed by Applicant.

Regarding claim 16, Danen does not exemplify an embodiment wherein fragments of the detonated energetic material would comprise Mg and P. However, Danen does recite that Mg and the reaction product formed by reaction of Mg is suitable for use in the energetic material (col. 5, ln. 30-34). Absent a teaching of the criticality or showing of unexpected results from the detonated material containing some amount of P in the formed Mg containing fragments, it would not provide a patentable distinction over the prior art of Danen,

Regarding claim 17, the energetic material of Danen would be just as suitable for use in an anti-tamper device as the energetic device claimed since Danen teaches the same structure which is claimed.

### ***Response to Arguments***

Applicant's arguments filed 2-14-07 have been fully considered but they are not persuasive.

Applicant argues that although Danen teaches that reacting metals such as aluminum, titanium, magnesium, lithium and hydrides thereof may be used, Danen does not teach the use of non-adducted metal hydrides or metals with interstitial hydrogen. Applicant also asserts that since Danen exemplifies an embodiment which employs an



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adducted metal hydride, it teaches away from the use of non-adducted metal hydrides. such as is claimed.

As was recited in the rejections above, it would have been obvious to one of ordinary skill in the art to have used any form of hydride including non-adducted metal hydrides or metals with interstitial hydrogen with a reasonable expectation of success. Absent a teaching of the criticality or showing of unexpected results, the claimed metal hydrides do not provide a patentable distinction over the prior art.

Applicant states that the use of an adducted hydride generates a number of undesired byproducts upon ignition. However, Applicant has provided no evidence to support this assertion.

#### ***Prior Art not Relied Upon***

The following is a listing of prior art which as deemed pertinent to the present invention however it was not relied upon in the rejections above:

Nielson et al (US 6,224,099) teaches an energetic materials comprising metal materials including hydrides and oxidizing materials including materials such as RDX (col. 3, ln. 50-67).

Hinshaw et al. (US 5,439,537) teaches an energetic material comprising metal material and an oxidizing agent to form oxide portions. Hinshaw further teaches that hydrides of the metal may be employed in the energetic material (col. 3, ln. 25-48).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jason Savage  
3-14-07



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3/15/07